THE DER UPDATE

www.eren.doe.gov/der • Volume 3, Number 12 • April 12, 2002

Distributed Energy Resources...the Power of Choice

Industry News

FuelCell Energy's Hybrid Receives Patent

FuelCell Energy, Inc. has received a U.S. Patent (#6,365,290) for a combined-cycle Direct Fuel Cell/Turbine (DFC/T®) power generator titled "High Efficiency Fuel Cell System." The turbine is powered by the waste heat generated by the fuel cell, which increases efficiency and reduces the cost of power without using additional fuel. The system is expected to reach 75 percent efficiency. FuelCell Energy plans to target large distributed generation markets, focusing on 10 to 50 MW plants that are connected to the grid, and larger-scale onsite generation for commercial and industrial customers. The DFC/T system is based on a 250kW fuel cell integrated with a model 330 Capstone microturbine, and the company intends to demonstrate a Capstone C60 model microturbine with the fuel cell to test its efficiency.

Source: Energy Info Source, FuelCell Energy Press Release, April 3

PV-Battery System to be Installed in NY

SatCon Technology Corporation, PowerLight Corporation, and ZBB Energy Corporation have begun a collaborative effort to develop solar distributed generation (DG) power systems. SatCon is contributing its StarSine Power Conditioning System (PCS), PowerLight is designing and manufacturing the solar photovoltaic (PV) panels, and ZBB is providing the advanced battery energy storage unit to create the DG system. The first 50kW system will be installed at Greenpoint Manufacturing and Design Center in Brooklyn, New York, and will be partially funded by the New York State Energy Research and Development Authority. The system will work in coordination with the ConEd grid, offsetting peak power requirements during the week and recharging during the weekend. During the announcement of this new effort, David Eisenhaure, President and Chief Executive Officer of SatCon, said, "These distributed power systems are an important step to achieving the US federal government's initiative to reduce dependence on hydro-carbon fuels and to secure domestic energy while reducing green-house gases."

Source: Energy Info Source, SatCon Technology Corporation Press Release, April 9

ChevronTexaco Expands Fuel Cell Development

ChevronTexaco Technology Ventures has announced that its subsidiary, Analytic Energy Systems, LLC, acquired portions of Dais-Analytic Corporation's fuel processing and fuel cell group to expand its existing reforming technology capabilities. The company plans to use the new acquisition to provide comprehensive fuel processing and fuel cell system integration solutions by creating devices that generate hydrogen from natural gas, propane, gasoline, and diesel. Greg Vesey, President of ChevronTexaco Technology Ventures, commented on the acquisition, stating that, "The ability to convert or process readily available hydrocarbons into hydrogen is a critical step in enabling widespread commercialization of fuel cells. ChevronTexaco is committed to the development and marketing of energy technologies, and this venture is a key part of our strategy."

Source: Energy Info Source, ChevronTexaco Technology Ventures Press Release, April 8

Burns and McDonnell's BCHP Project

Burns and McDonnell will lead one the teams selected by the Department of Energy to pioneer development of the first generation of Buildings Cooling Heating and Power (BCHP) systems. BCHP systems integrate on-site power generation with heating, cooling and humidity control equipment to meet the energy needs of commercial, institutional and multifamily buildings. Burns and McDonnell, partnered with Solar Turbines Inc. and Broad USA, was awarded approximately $3 million as part of a cost share contract to design and build a prototype BCHP system. The system will use a natural-gas fired turbine in combination with absorption chillers to provide electricity, cooling, heating and hot water using waste heat from the turbine.

Source: District Energy, First Quarter 2002

Hybrid System Passes Tests at UC-Irvine

Siemens Westinghouse Power Corporation and Southern California Edison have announced that a hybrid fuel cell-microturbine system being tested at the National Fuel Cell Research Center at the University of California-Irvine passed a key site acceptance test. The system passed the 1,000-hour proof-of-concept period. The next step is to operate the system for an extended period of time to ensure system reliability; the contract calls for a total test program of 3,000 hours. The system combines a Siemens Westinghouse solid oxide fuel cell

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*A new study by Primen, an energy market intelligence company, indicates that shipments of microturbines grew 15 percent in 2001.**

Five Teams Chosen to Conduct DER R&D in Data Processing and Telecom Industry

The U.S. Department of Energy announced on April 2 that five industry teams have been chosen to receive $9 million in funding to conduct research, development, and testing on distributed energy resources in the high-tech data industry. Energy Secretary Spencer Abraham stated, "These teams will work to develop systems that will improve power quality and reliability in data processing or telecommunications." The projects that have been selected for contract negotiations include:

- Durst Development, New York, New York, up to $3 million—design a high efficiency, low emission, and reliable DER/combined heat and power (CHP) system that utilizes gas turbines and steam-driven absorption chillers to provide electricity and chilled water for heating, ventilation, and air conditioning for a new data center in Manhattan.

- EPRI-PEAC, Knoxville, Tennessee, $150,000—develop a methodology to allow end-users to compare the true value of DER technologies, with traditional alternatives for high quality, reliability, and availability of power to determine how power quality events impact mission-critical equipment. Assess the value of various power conditioning options that seek to avoid or reduce power quality events.

- Honeywell, Minneapolis, Minnesota, approximately $1.1 million—design and field-test a DER/CHP system consisting of five 60 kW microturbines and a 500-ton absorption chiller. Develop system designs and control algorithms to improve understanding of the sequencing and interaction of multiple DER/CHP units in meeting overall load requirements. The system will be installed in a new data center at the University of Miami Medical Center and will allow the facility to operate independent of the utility grid.

- Sure Power Corporation, Danbury, Connecticut, up to $2.2 million—develop a DER/CHP system with 99.9999% reliability by identifying end-use requirements specific to the high-tech data industry. Testing will be conducted at an Exodus Internet data center near Seattle, Washington.

- Verizon, Harrisburg, Pennsylvania, up to $3 million—use multiple fuel cells and reciprocating engines in conjunction with CHP to power a large central office facility in New York as part of its Central Office of the Future Project to increase understanding of controls for multiple DER units and utilize low-grade heat for CHP benefits. Conduct research and evaluation of the first DC-to-DC powering of telecommunications equipment in North America at another central office.

The projects will last up to three years and industry will contribute at least 50 percent of the total contract value. The research will contribute to the Department of Energy's mission to develop the next generation of clean, efficient, reliable, and affordable distributed energy technologies, and will address goals set by President Bush in the National Energy Policy to provide for a reliable energy infrastructure.
U.S. Department of Energy Press Release, April 2

with an Ingersoll-Rand microturbine and has the capacity to produce approximately 190 kW of electricity. Early test data show efficiencies of approximately 53 percent, and improvements to the technologies are expected to increase efficiencies up to 60 to 70 percent. Siemens Westinghouse plans to deploy fuel cell products in the commercial market by fall 2003. Funding for this $16 million project comes from the U.S. Department of Energy, Edison International, the Electric Power Research Institute, the South Coast Air Quality Management District, and the California Energy Commission.
Source: U.S. Department of Energy Press Release, March 27; Eyeforfuelcells.com, April 4

New President for IR Business Unit

Ingersoll-Rand (IR) recently named Randall J. Adleman president of the company's Energy Systems business unit. Mr. Adleman joined IR Energy Systems in April 2001 as vice

president of marketing, sales and service. He has more than 20 years of customer-focused leadership experience, having served in various management roles for several major industrial companies. In his new role, Mr. Adleman will oversee the entire range of development, marketing, sales and service strategies for IR Energy Systems' innovative PowerWorks™ microturbine line, which offers a significant breakthrough in power efficiency, endurance, system versatility and compact design.

IR's 70kW PowerWorks™ systems represent an emerging alternative energy management technology. The PowerWorks™ microturbine is designed to operate 24/7 and burns fuels such as natural gas to produce the same type of high quality electricity provided by a utility grid. With built-in cogeneration capabilities -- which means they can harness the

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*According to the report, the shipments to distributors were far below the beginning-of-the-year forecasts, due to uncertainty in energy markets at the time.**

heat used in the production of electricity to supply heat for other applications such as hot water -- IR's PowerWorks microturbine systems are capable of serving both the electricity and heating needs of a diverse range of businesses, including supermarkets, hospitals, small industrial factories, schools, resorts and hotels.
Source: Ingersoll-Rand Press Release, April 10

Whistler Announces Plans for Future

Sacramento, CA-based company Whistler, Inc. recently announced plans to raise financing through a private placement. The company said the proceeds of the placement will be used to retire debt and continue development of its fuel cell division. In addition, Whistler said it hopes to manufacture 180 fuel cells in the one- to five-kilowatt range, and sell the units to development partners and select original equipment manufacturers (OEMs) for "field-testing" over the next eight months. The company said it is also currently negotiating a deal under which it would purchase a simulation, visualization and optimization software platform to design, analyze and compare different power plant configurations and design specifications for its proton exchange membrane.
Source: Fuel Cells Today, April 10

Announcement

DE and EE Employment in Australia

The CSIRO (Commonwealth Scientific and Industrial Research Organization) is Australia's largest technological research and development agency and one of the largest in the world. It is involved in strategic and applied research, development, demonstration, and commercialization and seeks to collaborate widely with partners in industry, government, universities, and other organizations both within Australia and internationally.

Recent developments at CSIRO have included:

- "Energy Transformed – Solutions to Australia's Energy-Greenhouse Challenges" has been adopted as one of a small number of Flagship programs addressing national priorities. This program encompasses Distributed Energy and Power, Efficient Energy Use, New Generation Transport, and Energy Systems/Greenhouse Modeling.

- The CSIRO Centre for Distributed Energy and Power (CenDEP) involving industry and government members at all levels across the energy chain, and associated stakeholders in greenhouse and environmental areas has been initiated. The aim is to be the focus for Australian R&D activities and international links on Distributed Energy & Power, including technological inputs to federal and state policies and market development thrusts. Positions such as project and program leaders, business development managers, and senior executives such as CenDEP Director or Flagship Program Director, are planned. In addition, the Australian government has schemes such as high-level Federation Fellowships to encourage distinguished Australians and non-Australians, and younger Australians currently overseas, to seek positions in Australia.

For further details and/or expressions of interest contact:
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Calendar of Events

APRIL 2002			
15-17	EESAT 2002, Electric Energy Storage—Applications and Technologies	San Francisco, CA	www.sandia.gov/EESAT; Dr. Imre Gyuk (202) 586-1482
15-17	EEI Strategic Issues Conference	Orlando, FL	www.eei.org
15-17	American Power Conference	Chicago, IL	www.apc-pennwell.com
16-17	Second DOE/UN International Conference and Workshop on Hybrid Power Systems	Charlotte, NC	www.netl.doe.gov click on "events"
21-23	4th Annual Small Fuel Cells Conference	Washington, DC	custserv@knowledgefoundation.com
23-24	Reciprocating Engine Peer Review	Chicago, IL	Brian Marchionini 202-406-4109
30-May2	Houston Energy Expo	Houston, TX	www.nesanet.org
30-May2	Thermally Activated Technologies Peer Review	Nashville, TN	Jan Brinch 410-290-0370

*In addition to the unpredictable energy markets, there were other barriers to market acceptance including high natural gas prices and technical problems experienced by developers and vendors.**

Calendar of Events

MAY 2002			
1-3	External Combustion Engines—New Strategies for Efficient, Green Power Generation	Los Angeles, CA	chuck@intertechusa.com
2	Green Power: Turn it On! Getting to 10% Conference	Harrisburg, PA	Maryanne Daniel; 215-656-6964
6-7	Securing the Energy Infrastructure: Essential Strategies	Washington, DC	www.kemaseminars.com
6-8	Interconnecting Distributed Generation to Utility Distribution Systems	Madison, WI	http://epdweb.engr.wisc.edu/brochures/a873.html
6-10	2002 On-Site Power Generation School	Dallas, TX	www.egsa.org/meetings/schools.htm
12-14	American Gas Association Operations Conference	Chicago, IL	www.aga.org
12-15	The 8th National Clean Cities Conference and Expo	Oklahoma City, OK	www.ccities.doe.gov/conference.shtml
14-15	Distributed Generation Technology Seminar	Andover, MA	www.basler.com
14-16	E-Vision 2002: Shaping Our Future by Reducing Energy Intensity in the U.S.	Arlington, VA	Jeff Dowd; jeff.dowd@ee.doe.gov
14-17	Distributed Energy Conference	San Diego, CA	www.powerin.org
20	Congressional Fuel Cell Expo	Washington, DC	www.usfcc.com
20-21	Renewable Energy	Houston, TX	www.cbinet.com
23-24	FEMP DER Workshop	Atlanta, GA	www.eren.doe.gov/femp/techassist/der_resources.html
JUNE 2002			
2-5	Energy 2002 Workshop and Expo: Hot Challenges, Cool Solutions	Palm Springs, CA	(703) 243-8343, www.energy2002.ee.doe.gov
6-7	West Coast Energy Management Congress	Anaheim, CA	(703) 243-8343, www.aeecenter.org
16-18	National Accounts Conference and Exhibition (American Gas Association)	Nashville, TN	TheGasChoice.com
20-21	Transmission Reliability Peer Review Meeting	Arlington, VA	jblais@sentech.org
25-26	DER FEMP Workshop	Chicago, IL	www.eren.doe.gov/femp/techassist/der_resources.html
26-29	Building Energy 2002 and the Mid-Atlantic Sustainability Conference	East Brunswick, NJ	www.nesea.org
AUGUST 2002			
18-23	Summer Study on Energy Efficiency in Buildings	Pacific Grove, CA	www.aceee.org

** The Primen report includes an analysis of microturbine commercialization and discusses Japanese microturbine activities. It is available at www.primen.com (registration required). Source: EnergyCentral.com, April 9*